

(b) adding to (a) a polymerase enhancing composition comprising at least one component possessing nucleic acid polymerase enhancing activity selected from:

an isolated or purified naturally occurring protein, possessing polymerase enhancing activity, obtained from a bacterial, eukaryotic, or archeabacterial source;

a wholly or partially synthetic protein having the same amino acid sequence as the naturally occurring protein or analogs thereof, possessing polymerase enhancing activity;

polymerase-enhancing mixtures of one or more of the naturally occurring proteins, or wholly or partially synthetic proteins;

polymerase-enhancing protein complexes of one or more of the naturally occurring proteins, or wholly or partially synthetic proteins; and

polymerase-enhancing partially purified cell extracts containing one or more of the naturally occurring proteins.

44. (Amended) A method of any one of claims 41, 42, or 43, further comprising at least one of:

a site-directed mutagenesis process,

a cycle sequencing process, and

a cloning process.

69. (Amended) A method of enhancing a nucleic acid polymerase reaction comprising adding a P45 protein to a polymerization reaction, wherein the P45 protein is in monomeric, dimeric, or multimeric form, and wherein the P45 protein is produced

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from a cell containing a DNA construct comprising a sequence encoding PEF protein P45 operably linked to an expression vector.

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73. (Amended) A method according to claim 71, wherein the dUTPase activity comprises one or more of [a P45 protein as claimed in claim 59,] a human dUTPase, a bacterial dUTPase, an archael dUTPase, a yeast dUTPase, a mammalian dUTPase, an animal dUTPase, or a P45 protein, wherein the P45 protein is in monomeric, dimeric, or multimeric form, and wherein the P45 protein is produced from a cell containing a DNA construct comprising a sequence encoding PEF protein P45 operably linked to an expression vector.

74. (Amended) A method according to claim 72, wherein the PEF activity comprises a P45 protein, wherein the P45 protein is in monomeric, dimeric, or multimeric form, and wherein the P45 protein is produced from a cell containing a DNA construct comprising a sequence encoding PEF protein P45 operably linked to an expression vector.